

# AGRICULTURE AND FORESTRY SECTOR: CONSERVATION TILLAGE

## ◆ IOWA

### Alternative Tillage Systems for Energy Conservation

Tillage is the practice of plowing soil, sowing seeds, and incorporating residue from previous crops in a field before replanting it. There are a number of different types of tillage systems, each requiring different energy inputs. Field tillage accounts for a significant portion of the energy involved in growing corn and soybeans in Iowa (up to 11%). However, much of the tillage done by farmers each year may be unnecessary. In addition to using large amounts of energy, conventional tillage practices also exacerbate soil erosion problems. Sustained erosion can lead to declining soil productivity in the long term. In addition, farm subsidies are contingent on meeting erosion criteria, making farming practices that reduce erosion even more attractive to farmers. Studies show that reducing tillage is the most practical way to reduce erosion in Iowa. Conservation tillage techniques include a number of reduced tillage practices as well as the more extreme no-tillage approach. A coalition of conservation agencies, farm groups, and chemical companies are working to educate Iowa farmers about the benefits of conservation tillage through a number of programs.



### Results:

In 1998, a total of 23.2 million acres were planted in Iowa. Farmers used no-till or reduced tillage, rather than conventional tillage techniques, on 51.3% (or 11.9 million acres) of this area. This represents an increase in conservation tillage from the late 1980s when only 29.5% of acreage was conservation tilled. Conservation tillage in Iowa can save 1 to 2 gallons of diesel fuel per acre. This equates to 11.9 to 23.8 million gallons of diesel fuel each year, or between 129,000 metric and 257,000 metric tons CO<sub>2</sub> (35,000 to 70,000 MTCE\*). At a price of 74 cents per gallon of diesel, conservation tillage resulted in direct savings between \$8.8 and \$17.6 million. In addition to the energy-related benefits, conservation tillage may result in increased storage of soil carbon relative to conventional tillage; this benefit has not been quantified.

Conservation Tillage Acreage	Greenhouse Gas Reductions	Direct Cost Savings
11.9 million	35,000 MTCE* to 70,000 MTCE*	\$8.8 million to \$17.5 million

### Principal Actors:

Iowa Department of Agriculture and Land Stewardship Division of Soil Conservation; The Iowa State University Agronomy Department in association with the Iowa Integrated Farm Management Demonstration Project; and U.S. Department of Agriculture Natural Resources Conservation Services' Soil Quality Institute.

### Additional Information:

Jim Gillespie, Bureau Chief, Iowa Department of Agriculture & Land Stewardship, Division of Soil Conservation, 515-281-7043, [jgilldsc@osmre.gov](mailto:jgilldsc@osmre.gov).

This case study is based on information provided by Craig Stark, Iowa Department of Natural Resources, and downloaded from the Iowa State Agronomy Department website, <http://extension.agron.iastate.edu/soils/tillage.html>.

\*Original data have been converted from acres tilled to metric tons carbon equivalent (MTCE) using the following conversion factors:

- 1-2 gallons diesel saved per acre (Iowa Integrated Farm Management Demonstration Project)
- 6.5 lbs C/gallon of diesel fuel (Nebraska Geographic Alliance)